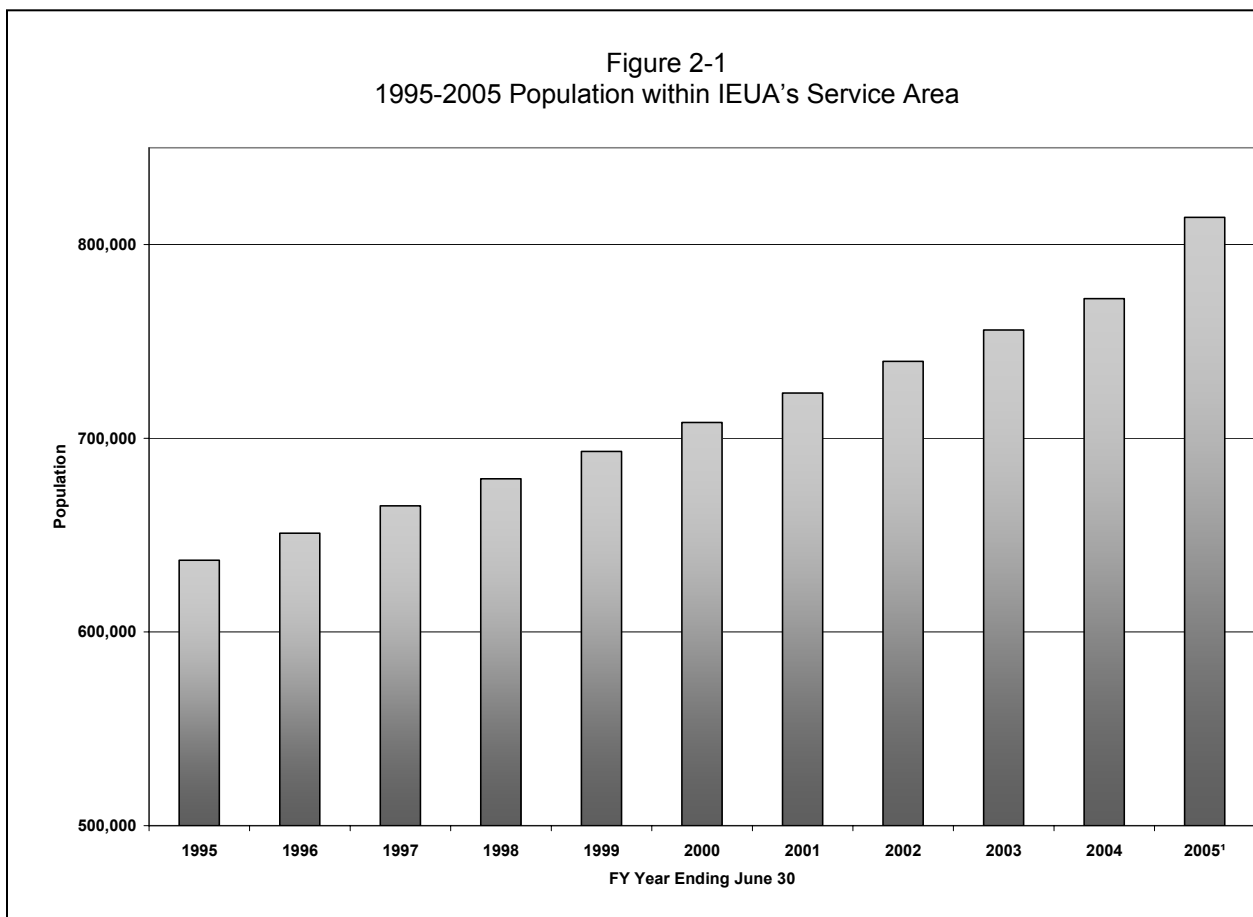


CHAPTER 2

POPULATION, LAND USE AND WATER USE

2.1 PAST POPULATION AND WATER USE

IEUA's service area has experienced rapid growth over the past ten years (see Figure 2-1). In 1995, the population within the service area was approximately 635,000 people. By 2000, the area had grown to a population of about 708,000, and by 2005 to 814,000. This means that in ten years the population has grown at an annual rate of increase of 2.8%. Roughly 59% of this population growth (about 106,000 people)



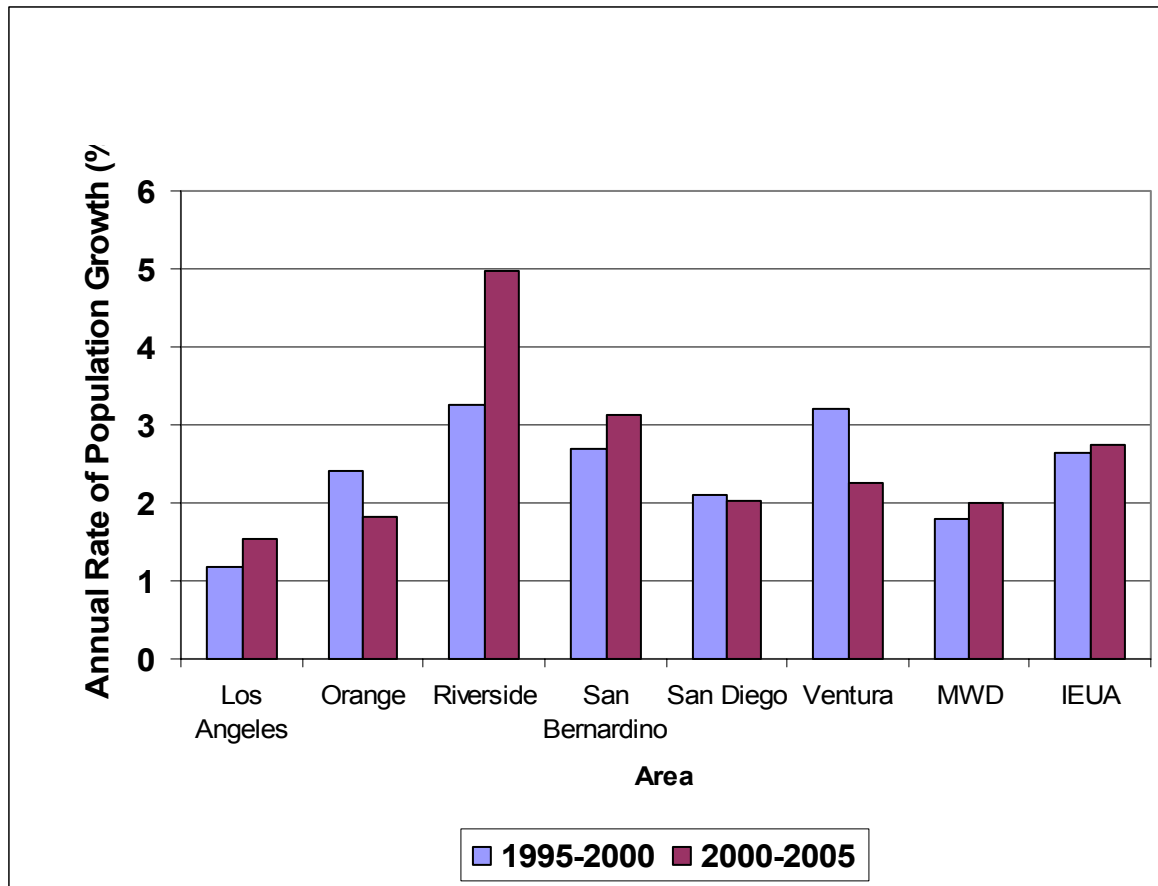
occurred between 2000 and 2005.

Source: MWD's 2005 RUWP

IEUA's service area is the most rapidly growing area within San Bernardino County (see Figure 2-2). The area's annual rate of growth is only exceeded by Riverside County which in the past five years has exceeded 5%. Within MWD's service area, IEUA's service area is experiencing one of the highest rates of growth. By contrast, Los

Angeles County has grown by less than 1.25% annually and Orange County at 1.5% over the same five year period.

Figure 2-2
Average Annual Population Growth
in MWDSC's Service Area



Source: MWD's 2005 RUWMP

The most populated cities within the service area are the cities of Ontario (169,125), Fontana (163,068), and Rancho Cucamonga, (169,855) as shown in Table 2-1. Over the past five years, the cities which experienced the most rapid annual growth were Rancho Cucamonga (5.5%), Fontana (5.3%) and Chino Hills (3.8%).

2.2 LAND USE TRENDS

In 1950, when IEUA was formed to distribute imported water supplies, the majority of the lands within its service area were used for field crops, citrus and vineyards. Urban areas constituted less than 8% of the total land use within the Chino Basin (see Table 2-2).

Table 2-1
1995-2005 Population by Communities within IEUA Service Area¹

	1995	1996	1997	1998	1999	2000
Chino	62,685	63,295	63,275	64,844	65,862	67,168
Chino Hills	47,791	49,689	51,982	54,966	58,271	66,787
Fontana	102,230	103,108	105,342	108,177	112,142	128,928
Montclair	29,731	29,923	30,058	30,298	30,625	33,049
Ontario	141,581	142,229	143,140	145,533	147,423	158,007
Rancho Cucamonga	114,587	115,768	117,294	119,068	122,221	127,743
Upland	65,940	66,133	66,450	67,377	68,112	68,393
Unincorporated	72,455	80,895	87,539	88,857	88,504	58,125
Total	637,000	651,040	665,080	679,120	693,160	708,200

	2001	2002	2003	2004	2005 ²
Chino	67,958	69,271	70,983	72,054	76,070
Chino Hills	68,798	71,532	73,366	76,401	77,819
Fontana	133,557	140,271	146,510	154,789	163,068
Montclair	33,553	34,130	34,478	34,729	51,930
Ontario	160,046	163,589	166,518	167,921	169,125
Rancho Cucamonga	131,709	138,211	147,394	154,780	169,855
Upland	69,592	71,066	72,183	72,709	73,235
Unincorporated	58,227	51,610	44,488	38,777	33,066
Total	723,440	739,680	755,920	772,160	814,168

¹1995-2004 data is from SCAG via MWD's Draft RUWMP, Sept 2005.

²2005 population data is an estimate taken from the local agencies UWMP's

Table 2-2
Land Use within Chino Basin

Land Use Category	1957	1975	1990	2001	+/- Change From 1957
Non-irrigated Field Crops and Pasture	10,486	8,610	593	542	-95%
Irrigated Field Crops and Pasture	29,993	22,472	21,064	19,006	- 37%
Irrigated and Non-irrigated Citrus	11,680	2,406	631	747	- 94%
Irrigated Vineyards	8,978	11,556	3,879	1,102	- 88%
Non-irrigated Vineyards	98	0	2321	1,362	+1390%
Native Vegetation	65,634	57,792	31,010	22,441	- 66%
Dairies and Feedlots	4,866	7,759	8,584	8,017	+ 61%
Total Non-urban	132,112	110,977	77,401	64,426	-51%
Urban Residential, Commercial, Industrial and Vacant	12,267	33,401	66,978	79,954	+652%
Special Impervious ¹	377	382	9319	11,209	+ 2973%
Total Urban	12,267	33,401	66,978	79,954	652%
Units of Measure: acres					

Source: Wildermuth Environmental Services

With its growing population, IEUA's service area has urbanized substantially since 1950. As shown in Figures 2-3 a-d, the agricultural lands located in the northern and central portions of the Chino Basin have been largely converted to residential, commercial and industrial uses. As of 2001, the total urban area within the Chino Basin had increased by 652% (from 12,300 acres to almost 80,000 acres) while agricultural lands (including dairies) had decreased by 51% (from 132,000 acres to 64,000 acres). Urban areas now constitute about 55% of the total land use within the Chino Basin.

Figure 2-3 a-d
1957-2001 Land Use Within Chino
Basin

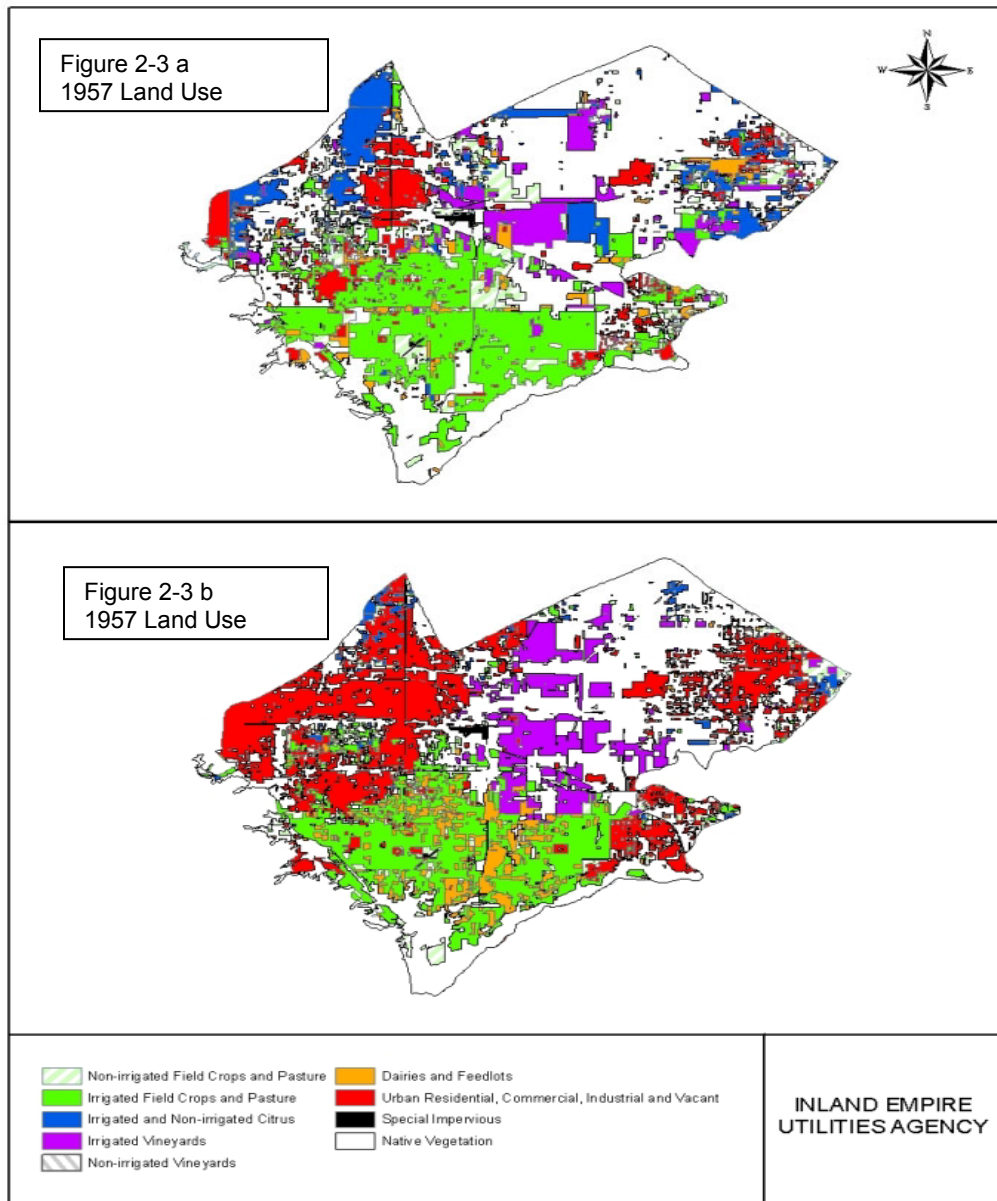


Figure 2-3 c
1990 Land Use

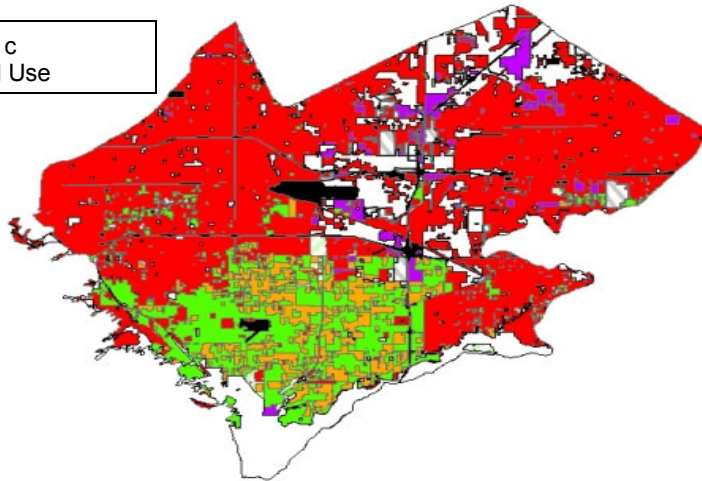
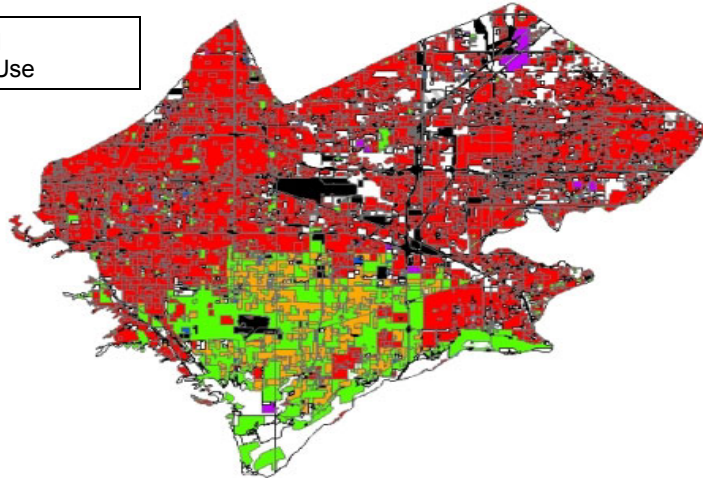


Figure 2-3 d
2001 Land Use



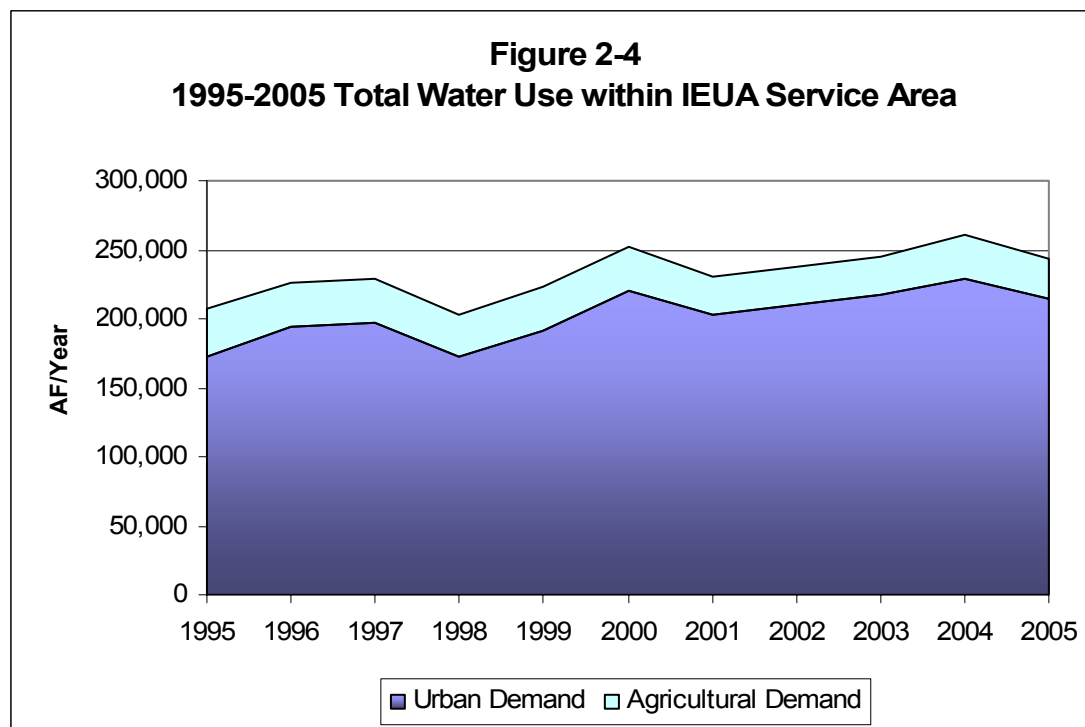
INLAND EMPIRE
UTILITIES AGENCY

2.3 PAST WATER USE

The majority of the water demand within the Agency's service area has historically been for urban (residential, commercial, industrial and institutional) uses. The remaining water has been used for agricultural purposes. In 2005, about 88% of the water demand was for urban use and 12% for agriculture.

The overall trend in the area's water demand in the past ten years has been one of growth, reflecting the increase in population and resulting urban uses (see Figure 2-4). Between 1995 and 2005, total water demand (urban and agricultural uses) within IEUA's service area grew about 36,000 acre feet (from approximately 208,000 acre-feet in 1995 to 244,000 acre feet in 2005). During the same period, the water used for agriculture declined from about 36,000 acre-feet year in 1995 to approximately 30,000 acre-feet per year in 2005, consistent with the conversion of these lands to urban development

However, in 2005, the trend towards increasing water usage was reversed. The 2005 total water demand was about 244,000 acre-feet, which is virtually the same amount of water used in 2000 despite significant growth in population over the five year period. Fiscal year 2005 was the second wettest year on record (within the last hundred years), which contributed to the reduced demand. In addition, regional conservation programs were significantly expanded during this five year period and contributed to the area's reduced water usage.



Source: IEUA 2005 UWMP, Table 2-3

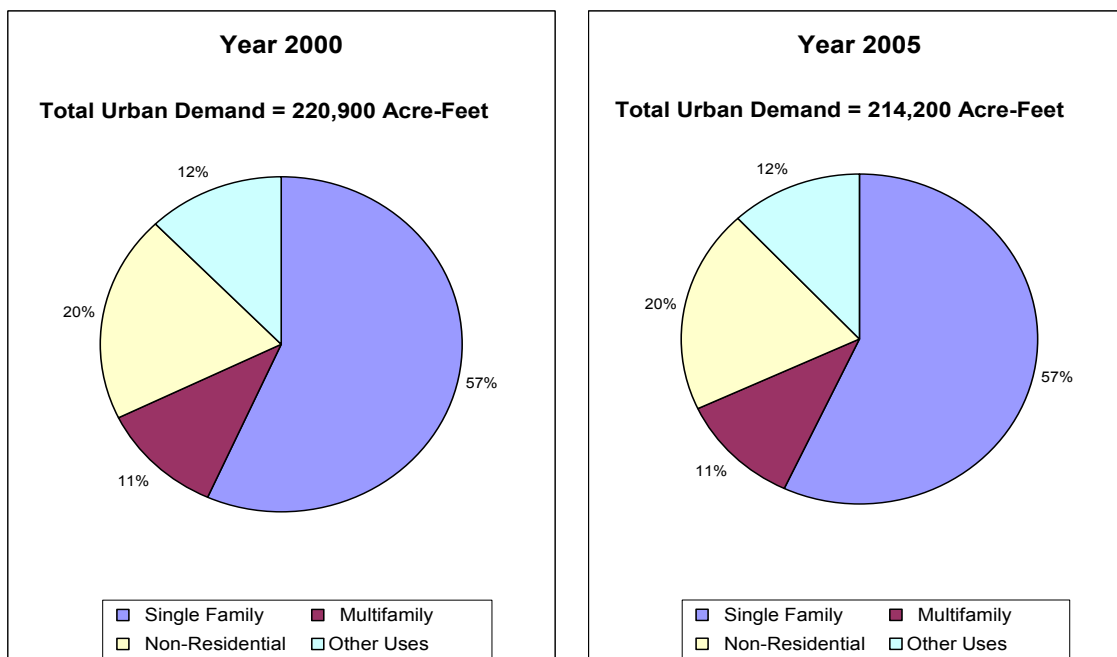
Overall, annual demand within the area has fluctuated with droughts and wet year cycles. The early 1990's were characterized by an intense drought (1988-1992) that sharply increased demand and then, as a result of the region's conservation efforts, decreased the area's water usage. Similarly, dry conditions prevailed between 2001 and 2003 and were followed by the extremely wet weather in late 2004 and early 2005.

All of the water used for urban purposes is distributed through the eight retail water agencies which serve the population within the area.* Water used for agricultural purposes is pumped directly from private wells.

The retail agencies that have the largest water demand within the service area are the Cucamonga Valley Water District (51,500 acre-feet per year), the city of Ontario (43,000 acre-feet per year) and the Fontana Water Company¹ (46,600 acre-feet per year) as shown in Table 2-3. The total urban water use for 2005 is estimated at 214,200 acre-feet.

Within the urban sector, more than half (57%) of the water used within IEUA's service area in 2005 is for single families (see Figure 2-5). The remaining demand is divided among non-residential (commercial/industrial) uses (20%), multifamily (11%) and unmetered uses and system losses (12%). (MWD assumes a leakage rate of 7.5% in the MWD-Main Model. The remaining 4.5% can be attributed to unmetered uses). These percentages are essentially consistent with 2000 urban sector uses.

Figure 2-5
Total Urban Water Demand by Sector of Use for 2000 & 2005



Source: Percentages for each sector are from MWD-Main tables.

¹ The Fontana Water Company (FWC) services a small area outside of the IEUA service area and gets additional supplies from San Bernardino Valley Municipal Water District. IEUA has reduced the FWC supply and demand numbers appropriately to more accurately reflect supply and demand within the IEUA service area.

Table 2-3
1995-2005 Water Demand by Retail Agencies
& Agricultural Water Use within IEUA's Service Area¹

Agency	1995	1996	1997	1998	1999	2000
City of Chino	12,638	13,695	14,556	13,003	14,252	15,764
City of Chino Hills	13,088	14,134	15,050	13,185	14,102	17,333
City of Ontario	37,551	41,401	42,866	38,841	42,614	46,420
City of Upland	19,871	21,318	21,730	18,397	20,653	23,038
Cucamonga Valley Water District	39,907	46,081	47,236	39,332	43,981	51,831
Fontana Water Company	33,120	35,979	38,448	33,928	37,907	44,317
Monte Vista Water District	10,525	11,250	11,818	10,138	12,076	11,924
San Antonio Water Company	5,169	9,695	5,515	5,588	5,992	10,257
Agricultural	35,966	32,941	31,814	30,775	32,336	30,993
Total³	207,835	226,494	229,033	203,187	223,913	251,877

Agency	2001	2002²	2003²	2004²	2005²
City of Chino	14,463	15,447	15,888	17,494	18,400
City of Chino Hills	16,608	15,242	16,567	18,402	16,726
City of Ontario	40,340	43,836	45,778	46,146	43,000
City of Upland	20,289	22,496	20,813	22,426	22,000
Cucamonga Valley Water District	48,536	50,669	49,737	55,119	51,500
Fontana Water Company	42,605	42,341	42,448	46,436	46,600
Monte Vista Water District	11,735	12,026	12,149	12,448	12,463
San Antonio Water Company	8,450	8,093	13,365	10,990	3,500
Agricultural	27,397	27,878	28,429	31,790	30,000
Total³	230,423	238,028	245,174	261,251	244,189

¹Data from Chino Basin Watermaster Assessment Tables. All values are fiscal year totals.

²Data from IEUA Annual Production Reports.

³Data for 2005 is estimated and does not include IEUA recycled water use.

2.4 PER CAPITA WATER USE

One measure of water efficiency is to estimate the average gallons of water used each day by each individual (gallons per capita daily, GPCD). It is important to note that per capita water use does not really reflect the amount of water actually used by an individual because the estimate includes all categories of urban water use, encompassing residential, commercial, industrial, fire suppression, and distribution system losses. Thus differences among communities, such as the percentage of residential and non-residential water uses, number and types of housing units, types of businesses, average number of people per household, average lots sizes, income level and climate, can all impact the average amount of water used per capita.

Table 2-4
1990-2005 Per Capita Water Use within IEUA's Service Area¹

Urban Per Capita Water Use in GPCD ²				
	1990	1995	2000	2005
IEUA	274	241	279	243

¹Data from IEUA retail demands (Table 2-3) and MWD (Table 2-1)

²Gallons Per Capita Per Day

In 2005, the per capita water use within IEUA's service area was 243 GCPD (see Table 2-4). This level is slightly lower than the estimates provided by MWD for San Bernardino County. As shown in Table 2-5, per capita water usage is higher in the hotter, inland areas than the cooler coastal communities. In addition, IEUA's service area includes water intense industries, such as steel making and fabric dying, which tend to increase per capita levels.

Table 2-5
Per Capita Water Use within MWDSC's Service Area

County	1990	1995	2000	2005
Los Angeles	188	167	175	171
Orange	231	196	205	192
Riverside	293	219	258	258
San Bernardino	273	213	*	255
San Diego	204	164	185	179
Ventura	227	179	198	205
MWD Total	208	177	*	187

Source: MWD Draft RUWMP (Sept. 2005).

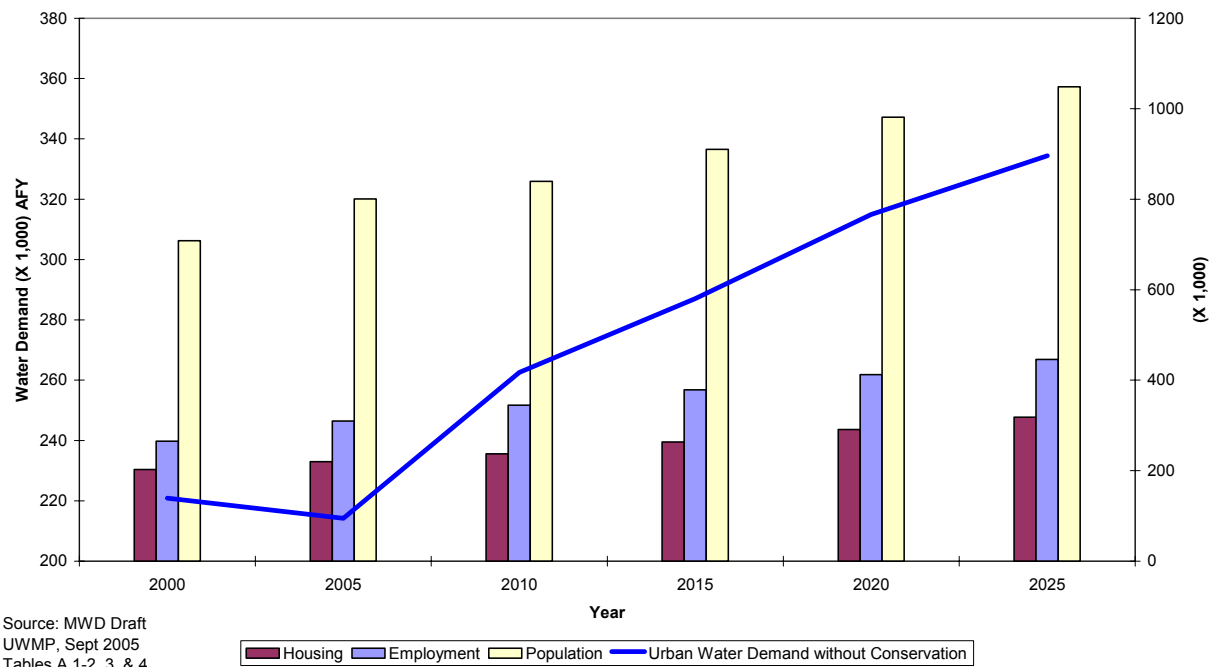
Since 1990, IEUA's per capita water usage has declined by about 30 GPCD. This suggests that water use within the area is becoming more efficient. This trend is consistent with the water use data for California and the nation as a whole, and reflects the effectiveness of improved water efficiency standards for appliances and the overall conservation efforts.

According to the Pacific Policy Institute of California², the state expects water use to continue to become more efficient as utilities implement efficiency programs. Presently, water use in the state is 232 GPCD. That number is expected to fall to 221 GPCD over the next 25 years representing a 4.6 percent decline.

2.5 FUTURE POPULATION AND LAND USE

The population within IEUA's service area is expected to continue to grow over the next twenty years, but at a lower average annual rate of increase than experienced in the last fifteen years. The projected population for the area in 2025 is about 1,050,000 people. This represents an increase of almost 260,000 people over the twenty year period, with an annual growth rate of 1.7%.

Figure 2-6
2000-2025 Population, Housing and Employment Projections for
IEUA's Service Area



² Water For Growth: California's New Frontier 2005, Public Policy Institute of California, Page 19.

Figure 2-6 presents projections for the IEUA service area for population, employment, and housing. The source for these data is the Southern California Association of Governments (SCAG) from MWD's Draft UWMP (Sept. 2005) and are utilized herein. The local agency data for the population comes from various sources and so are inconsistent. Therefore, IEUA has utilized SCAG data throughout the remainder of the chapter. Urban water demand projections come directly from the local agencies' UWMPs.

Employment within the service area is expected to increase by 136,000 jobs over the next twenty years. This corresponds to an average annual increase of 2.2%. Housing stock is expected to increase as well. Almost 100,000 units will be built and occupied over the next twenty years, representing average annual increase of 2.3%.

By 2025, the most populated cities within the service area are projected to be Ontario (270,000), Fontana (225,000), Rancho Cucamonga (240,000) and Chino (125,000). Annual growth rates within these communities are projected to be 3.0%, 2.1%, 3.0% and 3.4% respectively.

Table 2-6
2005-2025 Projected Population by Communities
within IEUA's Service Area¹

	2000	2005	2010	2015	2020	2025
CHINO	71,668	78,715	91,090	114,978	124,476	126,646
CHINO HILLS	66,787	77,819	80,126	81,916	83,636	85,284
FONTANA	148,928	174,968	179,426	195,373	211,105	226,186
MONTCLAIR ²	46,049	54,930	59,600	66,750	71,250	76,000
ONTARIO	158,394	172,408	203,811	225,385	248,424	273,047
RANCHO CUCAMONGA ³	142,743	178,855	203,870	220,180	233,400	242,700
UPLAND	70,393	73,235	73,600	73,700	73,800	73,900
SAN ANTONIO (unincorporated)	3,238	3,238	3,281	4,290	4,413	4,586
Total	708,200	814,168	894,804	982,572	1,050,504	1,108,349

MWD Estimates⁴	708,200	800,900	839,700	910,900	981,200	1,048,500
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¹Data sources from local agencies UWMPs are variable and include Department of Finance, municipal planning dept's, and interpolation.

²Data from Monte Vista Water District 2005 Draft UWMP. Includes Montclair, portions of Chino and unincorporated areas.

³Data from Cucamonga Valley Water District's 2005 Draft UWMP. Include Rancho Cucamonga and portions of Upland, Ontario, and Fontana.

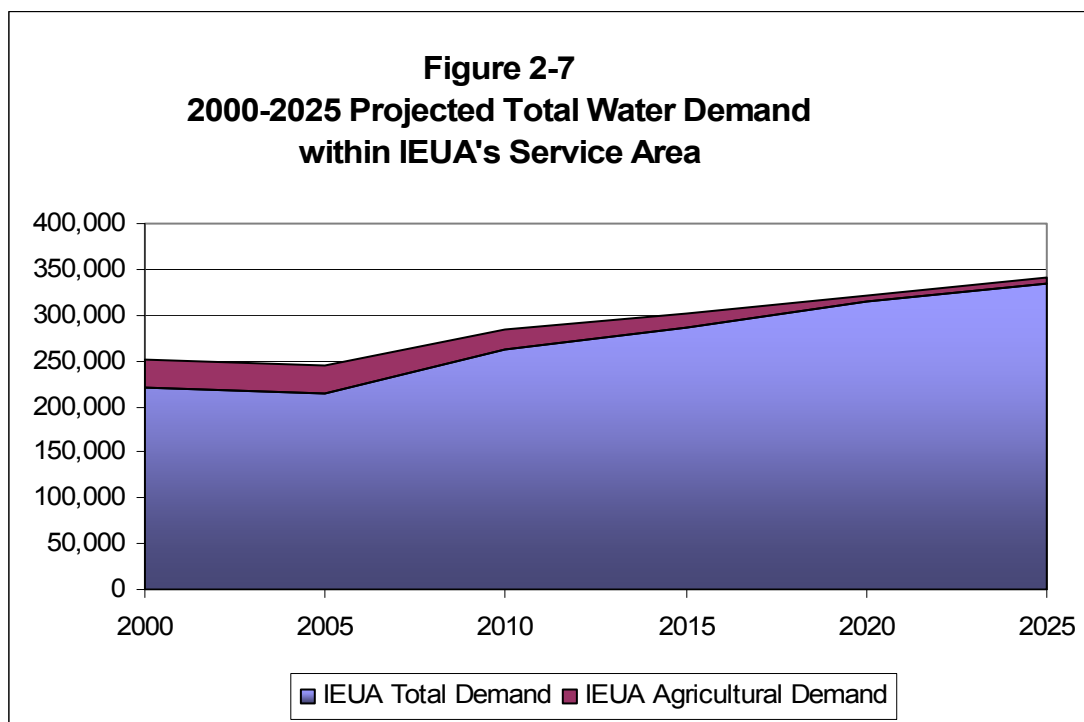
⁴SCAG data from MWD's Draft UWMP Sept 2005. For comparative purposes, unincorporated population included.

Anticipating the continued growth within IEUA's service area, the cities of Ontario and Chino have annexed dairy and other agricultural lands within the southern portion of the Chino Basin with the expectation that these areas will convert to urban uses. Similar annexations of unincorporated lands within the northern basin, particularly in the foothill areas adjacent to the cities of Rancho Cucamonga and Fontana are taking place. Many of these areas will become master planned communities, with predominantly single family, multi-family and commercial land uses.

Development in the southern most portion of the Chino Basin will be constrained by the Prado Basin flood plain. Lands below the 566 foot elevation are expected to remain in agriculture, open space or other land uses that are compatible with a potential 100 year flood on the Santa Ana River. While many of the region's dairies are transferring to other areas of the State or County, a portion of this industry is expected to remain in the Chino Basin.

2.6 FUTURE DEMAND WITHOUT ADDITIONAL CONSERVATION

Without additional conservation, total water demand (which includes agricultural production) within IEUA's service area over the next twenty years is expected to increase by approximately 97,000 acre-feet (from 244,000 acre-feet to about 341,000 acre feet per year, see Table 2-7)³. This represents a potential 39% increase in the area's projected water needs if no additional improvements in local water use efficiency occur during the next twenty years, including no increase in state and/or federal regulatory standards for water using appliances or processes, no local adoption of water efficiency standards for development and landscaping, and no implementation of new demand side management and conservation education programs within IEUA's service area.

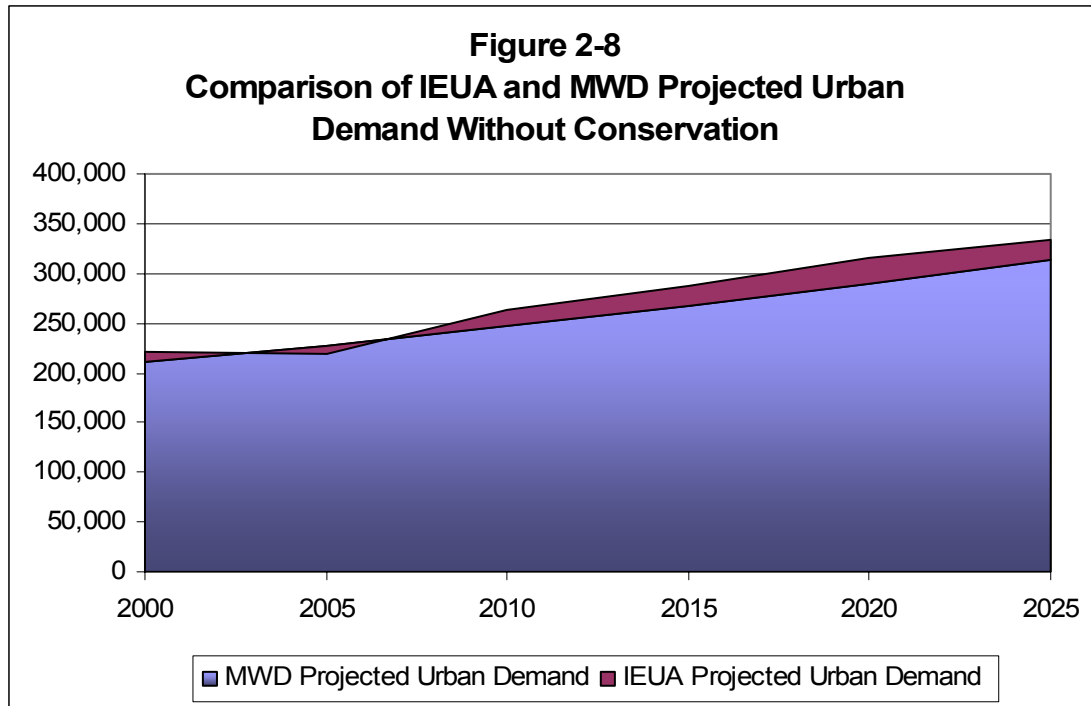


The conservative nature of these future demand projections are underscored when compared with the demand forecasts made by MWDSC for IEUA's service through its

³ The water demand forecasts used in preparation of IEUA's 2005 UWMP are based upon information provided by the respective retail agencies.

MWD-MAIN model (see Figure 2-8) (MWD RUMP, draft Sept. 2005, see Appendixes C & D). Overall, IEUA's urban water demand projections are up to 10% higher than those forecasted by MWD's model.

With the conversion of agricultural land to urban uses over the next twenty years, the percentage of water used in the area to meet urban demand will increase while the share of water used for agricultural purposes will decline. By 2025, urban water use is expected to be 98% of the water demand (about 341,000 acre-feet), while agriculture will use less than 2% (about 7,000 acre-feet).



By 2025, the retail agencies that are projected to have the largest water demand within IEUA's service area are the Cucamonga Valley Water District (at 86,000 acre-feet per year, a 67% increase above 2005 water usage), the city of Ontario (at 84,300 acre-feet per year, a 97% increase above 2005 water usage), and Fontana Water Company (at 66,000 acre-feet per year, a 43% increase above 2005 water usage) as shown in Table 2-7. Average annual rates of increase in the water demand being met by these retail agencies range from a low of 2.1% for the Fontana Water Company to a high of nearly 5% for the city of Ontario.

Total water demand in the IEUA service area includes water pumped from the Chino Groundwater Basin for agricultural purposes. Agricultural water production is provided because, presently, it is a significant use. Over the next twenty years as the region becomes even more urban, agricultural water production will decrease rapidly. Agricultural water use which is projected to decrease from 12 percent of total water use to 2 percent as the region becomes more urbanized. Much of the water pumped for agricultural production will instead be pumped for urban uses. Because agricultural water use will be limited in the Chino Basin, for the remainder of this chapter, water

demand will not include agricultural water production. Total projected urban demands are shown in Figure 2-8.

Table 2-7
Water Demand Projection by Local Retail Agencies ¹

	2000	2005	2010	2015	2020	2025
City of Chino	15,764	18,400	21,900	26,200	29,900	30,100
City of Chino Hills	17,333	16,726	22,700	24,700	25,400	26,400
City of Ontario	46,420	43,000	61,300	66,600	76,600	84,300
City of Upland	23,038	22,000	22,500	22,500	22,600	22,600
Cucamonga Valley Water District	51,831	51,500	65,400	72,500	79,500	86,000
Fontana Water Company	44,317	46,600	52,000	57,000	62,700	66,000
Monte Vista Water District	11,924	12,463	13,200	14,100	14,800	15,500
San Antonio Water Company	10,257	3,500	3,600	3,400	3,400	3,500
Subtotal	220,884	214,189	262,600	287,000	314,900	334,400
Agricultural Demand²	30,993	30,000	22,000	15,000	7,000	7,000
Total Demand³	251,877	244,189	284,600	302,000	321,900	341,400

	2000	2005	2010	2015	2020	2025
MWD M&I Demand⁴	212,000	226,600	246,700	267,200	289,900	312,800
Agricultural Demand	30,000	30,400	29,300	20,000	10,100	10,100
Total Demand	242,000	257,000	276,000	287,200	300,000	322,900

¹Demand projections taken from local agency's UWMPs

²OBMP Projections – Chino Basin Watermaster assumed portion in IEUA service area

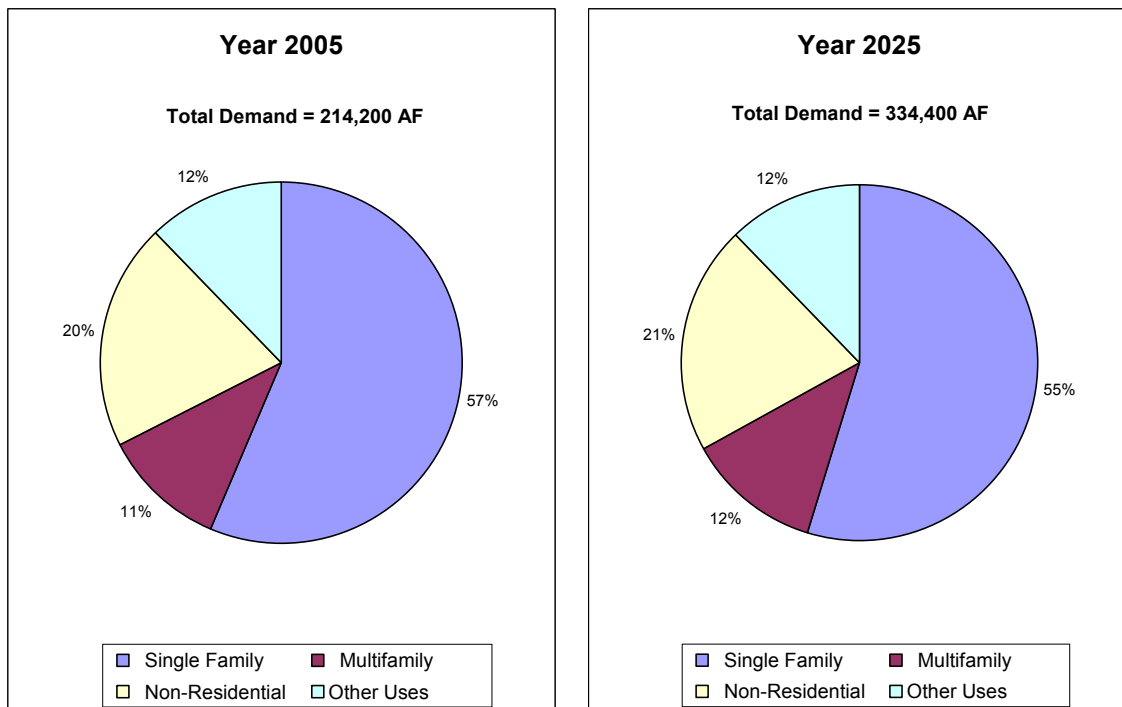
³Does not include conservation

⁴For comparison purposes – MWD Draft UWMP, Sept 2005, Table A.1.6

Without additional conservation, per capita water usage is expected to increase to more than 300 gallons per capita daily. See Table 2-9.

Within the urban sector, 55 percent of the water used within IEUA's service area by 2025 is forecasted for single family homes as shown in Figure 2-9. While three of the sectors remain relatively unchanged between 2005 and 2025, we see a decrease in single-family water use. Even though single-family homes are still being constructed at high rate (7,100 new homes in 2004), this decrease in water use percentage for single-family homes is probably due to the efficiencies that are being incorporated in all new homes throughout the IEUA service area. Since 67 percent of all urban water use in the IEUA service area is for residential dwellings (single-family and multi-family), this presents unique opportunities to expand conservation. For example, IEUA and the regional agencies will be initiating a program in 2006 to retrofit over 22,000 toilets in multi-family properties over a three-year period at no cost to the property owner.

Figure 2-9
Total Urban Water Demand by Sector of Use for Years 2005 and 2025



Source: Percentages for each sector are from MWD Main tables.

2.7 FUTURE WATER DEMAND WITH ADDITIONAL CONSERVATION

The service area's strong commitment to conservation and implementing water efficiency programs as part of its regional water management strategy is expected to substantially reduce projected water demands over the next twenty years. The retail water agencies in partnership with IEUA have adopted the goal of achieving a 10% reduction in the region's water use by 2010. By 2025, the region anticipates saving about 33,000 AFY, which will reduce actual water demand to 301,000 AFY (see Table 2-8).

The regional conservation program includes full implementation of the Conservation Best Management Practices plus additional programs and policies to ensure that all sectors of water use maximize water efficiency (see Chapter 4).

The impact of these conservation and recycled water programs can be seen in the reduction in the expected per capita water usage for the service area (see Table 2-9).

Table 2-8
2005-2025 Projected Water Demand with Conservation

	2000	2005	2010	2015	2020	2025
City of Chino	15,764	18,400	21,900	26,200	29,900	30,100
City of Chino Hills	17,333	16,726	22,700	24,700	25,400	26,400
City of Ontario	46,420	43,000	61,300	66,600	76,600	84,300
City of Upland	23,038	22,000	22,500	22,500	22,600	22,600
Cucamonga Valley Water District	51,831	51,500	65,400	72,500	79,500	86,000
Fontana Water Company	44,317	46,600	52,000	57,000	62,700	66,000
Monte Vista Water District	11,924	12,463	13,200	14,100	14,800	15,500
San Antonio Water Company	10,257	3,500	3,600	3,400	3,400	3,500
Subtotal	220,884	214,189	262,600	287,000	314,900	334,400
Projected Conservation Savings	4,500	8,600	26,260	28,700	31,490	33,400
Adjusted Projected Demand	216,384	205,589	236,340	258,300	283,410	301,000

Without additional conservation or recycled water development, per capita water usage is projected to increase from 239 GPCD to more than 300 GPCD. With regional conservation and recycled water programs, the per capita water usage within the service area is reduced to 223 GPCD, then rapidly decreasing as conservation and recycled water programs increase the local water supply. Even with the high growth rate the area is projected to see over the next 20 years, water use is expected to level off at 219 GPCD. The combination of conservation and water recycling programs are projected to reduce per capita water use by 85 gallons per day by 2025. At 219 GPCD, the region will be using less water than the projected state average of 221 GPCD.

Table 2-9
2005-2025 IEUA Service Area Per Capita Demands¹

	2005	2010	2015	2020	2025
GPDC w/o Conservation & Recycled Water	239	279	281	286	304
GPDC with Conservation & Recycled Water	223	230	219	211	219

¹ All values calculated as projected water demand (Table 2-7) divided by MWD projected population.

2.8 FUTURE WATER DEMAND SUMMARY

Figure 2-10 summarizes future average water demands for IEUA's service area with and without conservation.

